

PEDESTRIAN WALKWAYS (ZONES)

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ABSTRACT

“Walking is a mode of making the world as well as being in it” ~ Rebecca Solnit, Wanderlust: A History of Walking

Historically, walking was the primary mode of mobility to get from one place to another, either for work, or for social interaction, within short distances (since cities/ towns were smaller during those times), until the discovery of the wheel. With technological advancements and industrialization, work places moved farther from homes, and faster and mechanized forms of transportation gained prominence. Walking creates a connection between an individual and his physical surroundings-one is more aware of places, people and things in one's environment when one is walking. The feeling of being part of a community is accentuated when one is walking.

Factors influencing walk ability include the presence or absence and quality of footpaths/ sidewalks or other pedestrian rights-of-way, traffic and road conditions, land use patterns, accessibility, and safety, among others. Poor pedestrian infrastructure and amenities plague all cities all over the world. Even the most urbanized and forward-looking cities have less than desirable pedestrian facilities.

Today, people are restrained from walking comfortably around especially in the city centre due to rapid urbanization and increasing vehicle traffic. It is socially, aesthetically and economically important to provide people restrained by the urbanization movements with open spaces that are secure, comfortable, partly or totally cleansed from vehicle traffic. In order to specify the needs and suggestions of people, it is important to incorporate them into the processes of planning and designing pedestrian spaces which target to revitalize the historical urban fabric.

Key words : walking, pedestrian

1. INTRODUCTION

In ancient times, the basic form of transportation was to walk. The relationship between urban design and transportation dates back to ancient times. City design in the ancient cities of Mesopotamia, Egypt, and India stressed the laying out proper roads and triumphal avenues as a key ingredient for good design. Later, Greeks and Roman stressed the importance of laying out adequate roads (Sen, 1999).

Beginning the ancient times, pedestrian zones have been the mark of bustling, prosperous cities. Past civilizations banned vehicular and animal traffic from crowded areas, because of reduce pollution, alleviate congestion in the interests of safety and order, and create aesthetically pleasing urban areas. Until the automobile age, two types of pollution from vehicles were noise and manure (Rosen, 2006).

In the classical age, the order minded Romans used the pedestrian zones to solve design problems throughout their empire. During the middle Ages, Northern Italy was the most heavily urbanized area of Europe, claiming Europe's largest and wealthiest cities (Rosen, 2006). Street design became an integral feature of Roman cities, which had paved streets with elevated sidewalks. Concern for aesthetics of street design resurfaced during the Renaissance in fifteenth century Europe (Sen, 1999). The density of the industrial revolution greatly exacerbated the problems stemming from city life. Some of municipal

government prohibited cart and wagons transporting merchandise on selected central streets during most daytime hours (Rosen, 2006).

Since the Second World War, downtowns in which automobile access was restricted retained or saw increased activity for more often than downtown areas which were not pedestrianized. The modern pedestrian zone was born in Kassel, Germany, at the close of Second World War. With 80% of the city destroyed, urban planners saw once-in-a-lifetime opportunity. Over the next few years, most German cities and many in other European countries built pedestrian zones. The Dutch invented a compromise pedestrian zone for residential areas, that is popular throughout northern Europe. Cars and pedestrians share the roadway. Pedestrians are the priority users of the area. Automobiles are permitted at all times provided they do not exceed walking speed.

2. DEFINITION OF PEDESTRIAN ZONES

A pedestrian zone is simply an area where vehicles are restricted and reserved for pedestrians who are free to occupy the entire space. The zone entrances and exits are often designated with signage to make all users of the road aware when they are entering or exiting such an area.

As pointed out by Rubenstein (1992); three types of pedestrian malls have commonly been implemented in the United States. The first type consists of a traditional pedestrian street designed for exclusive pedestrian use (Full mall) (Figure2). The second type is the shared mall that permits limited automobile use such as one lane of one-way traffic (Semi mall) (Figure3). The third type is the transit mall which accommodates both pedestrian and transit use (Figure 4).



Figure 1. Pedestrian zones, Shimla, India

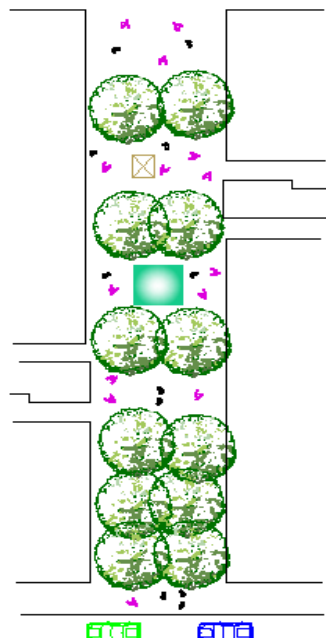


Figure 2: FULL MALL

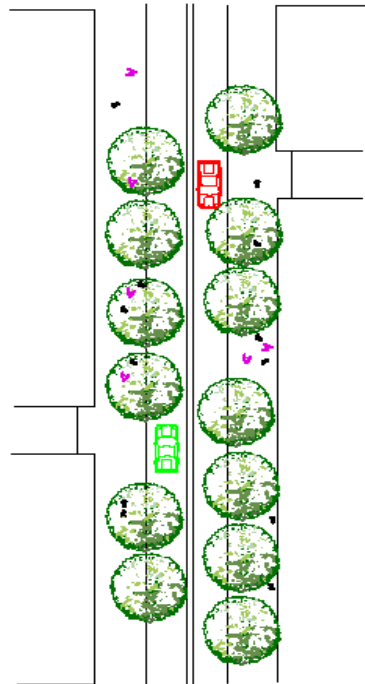


Figure 3: TRANSIT MALL

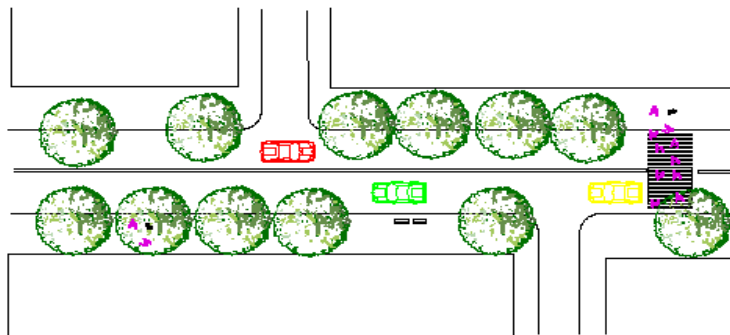


Figure 4: SEMI MALL

Characteristics for development of pedestrian zones were:

- high rates of walking and cycling.
- more independent movement and active play amongst children.
- less land taken for parking and roads - more available green or social space.
- very low levels of car use, resulting in much less traffic on surrounding roads.

The main benefits found for pedestrian zone developments:

- Low atmospheric emissions.
- Low road accident rates.
- Better built environment conditions.
- Discouragement of private car and other motorized vehicles (measure of travel demand management).
- Encouragement of active modes.

3. PEDESTRIAN WALKWAYS DESIGN PRINCIPLES

The following design principles represent a set of ideals which should be incorporated, to some degree, into every pedestrian improvement.

- The pedestrian system should be safe. Sidewalks, walkways and crossing should be designed to minimize conflicts with motorized and non motorized vehicle traffic, minimize tripping hazards and protruding objects, and promote a reality and perception of personal safety.
- The pedestrian system should be accessible to all. Pedestrians of all ages and ability levels need to be able to safely and conveniently travel on foot or with a mobility device.
- The pedestrian system should provide direct and convenient connections.
- The pedestrian system should provide comfortable place to walk.
- The pedestrian system should enhance the public realm of the city. The pedestrian system should be designed not only to serve a transportation function, but also to provide public spaces that enhance community, interaction, economic vitality, and the image of the city. Good design should enhance the look and feel of the pedestrian environment. The pedestrian environment includes open spaces such as plazas, courtyards, and squares, as well as the building facades that give shape to the space of the street. Amenities such as street furniture, banners, art, plantings and special paving, along with historical elements and cultural references, should promote a sense of place.
- Pedestrian improvements should be cost-effective and financially sustainable.
- The pedestrian environment should be used for many things. The pedestrian environment should be a place where public activities are encouraged. Commercial activities such as dining, vending and advertising may be permitted when they do not interfere with safety and accessibility.



Figure 5. Pedestrian zones, Delhi, India

Pedestrian safety, accessibility, mobility and comfort are enhanced by:

- Slower traffic speeds
- Fewer traffic lanes
- Narrower traffic lanes
- Shorter street crossing
- Clear visibility between pedestrian and vehicle at intersections
- A buffer from traffic provided by wider sidewalks, curbside bike lanes and street parking
- Tighter corner radii
- Space in the sidewalk corridor for trees planted boulevards, transit shelters, and other street furniture.

The pedestrian zone should be organized into four distinct subzones that maintain an accessible walking path and organize the placement of elements. The four subzones are the; **Kerb Zone, The Planting/Street Furniture Zone, the Through Walk Zone, and the Frontage Zone** (Figure 6). Minimum subzone dimension is given in below Table 1.

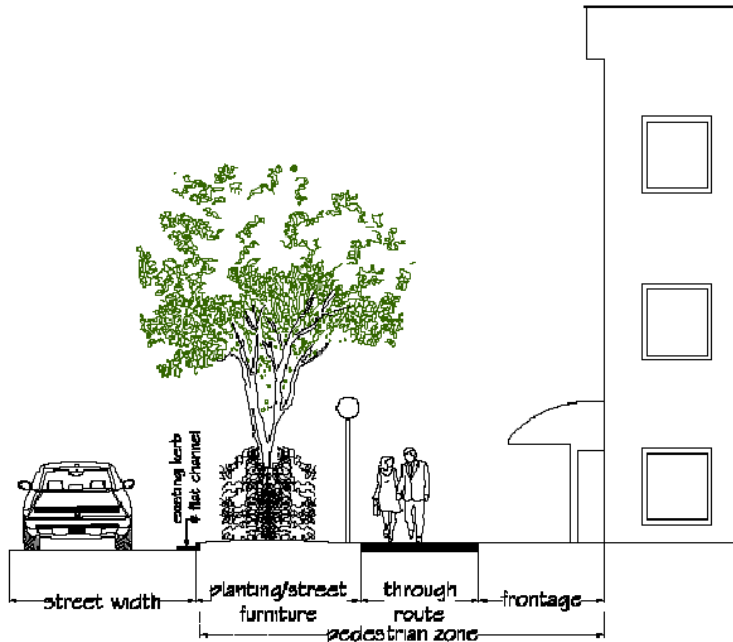


Figure 6 : Subzone of pedestrian zone

Location	Max. Pedestrian flow	Zone				Total
		Kerb	Planting/Street furniture#	Through route	Frontage	
Arterial roads in pedestrian district	85 p/min	0.15m	1.5 m	2.7m+	0.90 m	5.25m
CBD						
Alongside parks, schools and other major						
Local roads in pedestrian district	65 p/min	0.15m	1.5m	2.0 m	0.60 m	4.25 m
Commercial/industrial areas outside the CBD						
Collector roads	65 p/min	0.15m	1.2 m	2.0 m	0.30 m	3.65 m
Local roads in residential areas	50 p/min	0.15m	1.2 m	1.8 m	0.30 m	3.45 m
Absolute minimum*		0.15m	0.0m	1.8 m	0.0 m	1.95 m

Consider increasing this distance where vehicle speeds are higher than 55 km/h

*Only acceptable in existing constrained conditions and where it is not possible to reallocate road space

Table 1. Minimum Subzone dimensions

3.1 Kerb zone

A Kerb has the following functions:

1. Protection of Pedestrians from higher speed vehicles.
2. Guiding of traffic along the edge
3. Control/ regulation of Drainage

The zone is comprised of the top of kerb adjacent to the side walk.

3.2 The planting/Street furniture zone

The zone creates a psychological buffer between motorized vehicles and pedestrians. The zone contains trees, signs, public art, street lights, seats and parking meters, bicycle parking and other furniture. Trees benefit from as much space as possible. The minimum width required for tree planting is 5 feet; yet this is not desirable for long term tree health and vitality. Street Furniture is an important component of streets as it helps create resting or “pause” spaces along the daily paths of people and makes streets more enjoyable. All Street Furniture should be located within the Multi Functional Zone and kept CLEAR of the designated Walking and NMT zones of the street. Seating provided must be easy to clean, located in areas that are well watched, busy, and well shaded by trees or artificial canopies - to protect people from the harsh Delhi heat. Ideally low maintenance seating should be located under deciduous trees and designed for easy cleaning and maintenance.

3.3 Through route (or clear width)

This area should be kept free of obstructions at all times. The area contains the basic sidewalk width or clear area for pedestrian travel and is sized to provide for two directions of pedestrian travel. The area should have a safe and accessible walking surface and free of vertical obstructions and protruding objects (Figure 7,8).

To ensure pedestrian safety:

- Create “eyes on the street” – by removing setbacks and boundary walls and building to the edge of the street ROW. This would allow people from inside to look out on to the pavement, thus discouraging misbehavior, shady corners, peeing, etc.)
- In case enclosure of sites is required, transparent fencing should be used above 300 mm height from ground level.
- Require commercial facades to have minimum 30% transparency.
- Provide adequate Street Lighting for pedestrians and bicycles.
- Create commercial/ hawking zones at regular intervals (10 minute walk from every home in the city) to encourage walkability, increase street activity and provide safety. (e.g. Mumbai, Shanghai)
- 1.5 m is the absolute minimum through-route width allowing passage for a single Wheelchair.
- 2.0 m is the desired minimum path width (1.5 m absolute minimum) to allow for two wheelchairs to comfortably pass, widened to 2 m near schools and small local shops.
- 2.7 m desirable minimum through-route width(or higher based on demand) for commercial or shopping environments.



Figure 7: The Through pedestrian zone, Helsinki



Figure 8: The Through pedestrian zone, Mississippi

3.4 Frontage zone

The zone is the space at the edge of walkway adjacent to property line. The area that pedestrians naturally tend not to enter, as it may contain retaining walls, fences, pedestrians emerging from buildings, ‘window shoppers’ or overhanging vegetation. The Frontage Zone may also be used as a secondary area for plantings, street furniture and social activities.

4. Planting of pedestrian zone

For climatic comfort:

- Trees are an essential component for all streets – to provide shade to pedestrians and reduce solar gain.
- High albedo (diffuse reflectivity) materials for paving reduce urban heat island effect.
- Built to Pavement edge buildings with overhangs and arcades provide excellent protection to pedestrians.
- Use of native plants and shrubs help restore our natural ecosystems and help insure the survival of the full range of wildlife native to the area.
- The absolute minimum width of the planting strip should be fully 1.5 m. A planting strip of 3 m in width is much more reasonable. This gives enough mass and strength to the trunk to shrug off snow loads, and

should be tall enough to be up-branched to provide clearance for pedestrians and vehicles.



Figure 9 : Plantation in pedestrian zone

5. CONCLUSION

The goal of this research paper is to apprise the agencies to plan, design and implement well connected, safe, comfortable and sustainable pedestrian facilities that will encourage and inspire increasing number of people to choose walking as their preferred mode of travel for shorter trips (trips less than 2 -3 km) in cities. It is important to lay the framework in the form of goals and objectives at the beginning of the pedestrian planning process, so that any projects and decisions taken on pedestrian infrastructure are directed towards achieving these common goals.

Following guidelines should be followed to plan for pedestrian only streets:

- High density of commercialization along the street.
- High level of pedestrian activity.
- Optimum lighting for safety.
- Good street infrastructure like seating and landscape.
- Preferably should be a collector or a local street.
- Carriageway operating overcapacity.
- Connecting streets with well-designed sidewalks.
- Public transportation accessibility nearby.
- Vehicle parking availability nearby (either on street or multistoried parking).
- Provision for loading and unloading goods (designating times for the same).

Bikeways can be provided in the following three ways:

- Bike lanes along the carriageway, un-segregated.
- Bike lanes along the carriageway, segregated.
- Bike lanes along the sidewalks.

Out of the three, bike lanes along the sidewalks, sharing space with the pedestrians provide greater safety as compared to bike lanes sharing the carriageway. However when a bicycle lane is planned on a shared sidewalk, sufficient additional width should be allocated to the sidewalk. A minimum of 1.5 m additional width for sidewalk should be allocated to accommodate bicycle lanes.

Pedestrian Lighting

Proper lighting is an important aspect for the perceived safety of a pedestrian facility.

Pedestrian lighting should be provided:

- Along the sidewalk,
- At street corners,
- At access to at-grade crosswalk, and,
- All subways and foot over bridges should be well lit.

For illuminating pedestrian facilities, pedestrian specific lighting is preferred over the general high mast street lighting. Pedestrian light poles are of low-mast, 3 to 5 meters tall.

The following design aspects of pedestrian lighting are desirable:

- Full cutoff light fixture, which only directs light downwards, is preferable to reduce the ambient light and glare.
- Pedestrian lighting should be energy efficient.
- Trees and boarding should not obstruct the lighting.

Hawker Zone

Hawkers provide a wide variety of services and amenities to people, at convenient locations – with negligible investment and infrastructural costs. They form the eyes of the street to keep streets safe.

- They keep streets clean, busy, vibrant .
- They provide a variety of cheaper food and retail options.
- They express our unique culture.
- They generate self-employment for a large number of people.

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